

Attorney Docket No. 9286.7
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 Filed: July 2, 2002
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IN THE CLAIMS

Please amend the claims as follows. The following listing of claims replaces all prior versions.

1. (currently amended) A compound of the general formula (I)



wherein

X is an m-valent unit and

B are identical or different and denote K-R, wherein

K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein

A^1 is $(CH_2)_tY(CH_2)_u$, wherein

Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A^2 and any A^3 in any combination,

A^2 is $-NHCO-$ or $-CONH-$,

A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, $Gal\alpha 1-3Gal$, $Gal\alpha 1-3(Fuca 1-2)Gal$, $GalNAc\alpha 1-3(Fuca 1-2)Gal$, $Neu5Ac\alpha 2-6GalNAc$, $SiaLe^A$, $SiaLe^X$, HSO_3Le^A , HSO_3Le^X , $Gal\alpha 1-3Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3Gal\beta 1-4Glc$, $Neu5Ac\alpha 2-6Gal\beta 1-4GlcNAc$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc$, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, $HSO_3GlcA\beta 1-3Gal$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc\beta 1-3Gal\beta 1-4Glc$, $GalNAc\alpha$, $GalNAc\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $HSO_3(Sia)Le^X$, $HSO_3(Sia)Le^A$, Le^Y , $GlcNAc\beta 1-6(GlcNAc\beta 1-3)Gal\beta 1-4Glc$, $GalNAc\beta 1-4(Neu5Ac\alpha 2-3)Gal\beta 1-4Glc$, mannose-6-phosphate, $GalNAc\beta 1-$

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4GlcNAc, oligo-sialic acid, N-glycolylneuraminic acid, Gal α 1-4Gal β 1-4Glc, or
 Gal α 1-4Gal β 1-4GlcNAc; and

m is ~~at least 23~~ or 4,

with the proviso that

- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
- (4) the molar mass of the fragment X(K)_m is less than 20,000.

2. (previously presented) A compound according to claim 1, wherein the molar mass of the fragment X(K)_m is less than 4,000.

3. (currently amended) A compound according to claim 1, wherein

m is ~~an integer from 2 to 3~~ or 4, and

X is CH_{4-m}, NH_{3-m}, N⁺H_{4-m}, >P- (when m = 3), >P⁺< (when m = 4), >B- (when m = 3), a linear atom group C₂H_{6-m}, >CH(CH₂)_zCH<, >C=C<, >N-N<, >N(CH₂)_zN< wherein z = 2 - 6, when m = 4), a carbocyclic atom group C₆H_{6-m}, C₆H_{12-m}, or a heterocyclic atom group C₃N₃ (when m = 3), C₄N₂ (when m = 4).

4. (previously presented) A compound according to claim 1, wherein there are at least 3 K.

5. (previously presented) A compound according to claim 1, wherein at least two R are not hydrogen.

6. (currently amended) ~~A compound according to claim 1, wherein at least three R are not hydrogen.~~
A compound of the general formula (I)

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X(B)_m (I)

wherein

X is an m-valent unit and

B are identical or different and denote K–R, wherein

K is a bond or is A¹–(A²–A³)_t–sp, wherein

A¹ is (CH₂)₁Y(CH₂)_u, wherein

Y is >C=O, >NH, –O–, –S– or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A²–A³) can be any A² and any A³ in any combination,

A² is –NHCO– or –CONH–,

A³ is (CH₂)_r, O(CH₂)_r, or S(CH₂)_r, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, Galα1-3Gal, Galα1-3(Fuca1-2)Gal, GalNAcα1-3(Fuca1-2)Gal, Neu5Acα2-6GalNAc, SiaLe^A, SiaLe^X, HSO₃Le^A, HSO₃Le^X, Galα1-3Galβ1-4GlcNAc, Galα1-3Galβ1-4Glc, Neu5Acα2-6Galβ1-4GlcNAc, HSO₃GlcAβ1-3Galβ1-4GlcNAc, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, HSO₃GlcAβ1-3Gal, HSO₃GlcAβ1-3Galβ1-4GlcNAcβ1-3Galβ1-4Glc, GalNAcα, GalNAcα1-3(Fuca1-2)Galβ1-4GlcNAc, Galα1-3(Fuca1-2)Galβ1-4GlcNAc, HSO₃(Sia)Le^X, HSO₃(Sia)Le^A, Le^Y, GlcNAcβ1-6(GlcNAcβ1-3)Galβ1-4Glc, GalNAcβ1-4(Neu5Acα2-3)Galβ1-4Glc, mannose-6-phosphate, GalNAcβ1-4GlcNAc, oligo-sialic acid, N-glycolylneuraminic acid, Galα1-4Galβ1-4Glc, or Galα1-4Galβ1-4GlcNAc; and

m is at least 2,

with the proviso that

(1) in the compound at least three R are not hydrogen,

(2) there are at least two K that are not a bond, and

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- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
 (4) the molar mass of the fragment $X(K)_m$ is less than 20,000.

7-8. (canceled).

9. (currently amended) ~~A compound according to claim 1, wherein~~
~~m is an integer from 2 to 4,~~

~~X is CH_{4-m} ,~~

~~A¹ is CH_2 ,~~

~~A² is $NHCO$,~~

~~A³ is CH_2 ,~~

~~k is 8,~~

~~sp is $(CH_2)_3CONHCH_2CONHC_6H_4-4-CH_2O$ and~~

~~R is Neu5Aca2-6Gal β 1-4GlcNAc~~

A compound of the general formula (I)

$X(B)_m$ (I)

wherein

X is CH_{4-m} and

B are identical or different and denote K-R, wherein

K is a bond or is $A^1-(A^2-A^3)_t$ -sp, wherein

A¹ is CH_2 , wherein

Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A² and any A³ in any combination.

A² is $NHCO$,

A³ is CH_2 , wherein

r = 1.

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sp is (CH₂)₃CONHCH₂CONHC₆H₄-4-CH₂O-, and
k is 8, and
R is Neu5Acα2-6Galβ1-4GlcNAc; and
m is an integer from 2 to 4,
with the proviso that
(1) in the compound at least one R is not hydrogen,
(2) there are at least two K that are not a bond, and
(3) X, B and m are so selected that an intermolecular association of the K in liquid phase by
the formation of hydrogen bonds is possible, with formation of aggregates that present on
the surface a plurality of R that are not hydrogen, and
(4) the molar mass of the fragment X(K)_m is less than 20,000.

10. (currently amended) An aggregate of the general formula (II):



wherein X(B)_m may be identical or different and denote a compound of the general formula (I),



wherein

X is an m-valent unit and

B are identical or different and denote K-R, wherein

K is a bond or is A¹-(A²-A³)_k-sp, wherein

A¹ is (CH₂)_tY(CH₂)_u, wherein

Y is >C=O, >NH, -O-, -S- or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A²-A³) can be any A² and any A³ in any combination,

A² is -NHCO- or -CONH-,

A³ is (CH₂)_r, O(CH₂)_r, or S(CH₂)_r, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

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R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, Gal α 1-3Gal, Gal α 1-3(Fuc α 1-2)Gal, GalNAc α 1-3(Fuc α 1-2)Gal, Neu5Ac α 2-6GalNAc, SiaLe^A, SiaLe^X, HSO₃Le^A, HSO₃Le^X, Gal α 1-3Gal β 1-4GlcNAc, Gal α 1-3Gal β 1-4Glc, Neu5Ac α 2-6Gal β 1-4GlcNAc, HSO₃GlcA β 1-3Gal β 1-4GlcNAc, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, HSO₃GlcA β 1-3Gal, HSO₃GlcA β 1-3Gal β 1-4GlcNAc β 1-3Gal β 1-4Glc, GalNAc α , GalNAc α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc, Gal α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc, HSO₃(Sia)Le^X, HSO₃(Sia)Le^A, Le^Y, GlcNAc β 1-6(GlcNAc β 1-3)Gal β 1-4Glc, GalNAc β 1-4(Neu5Ac α 2-3)Gal β 1-4Glc, mannose-6-phosphate, GalNAc β 1-4GlcNAc, oligo-sialic acid, N-glycolylneuraminic acid, Gal α 1-4Gal β 1-4Glc, or Gal α 1-4Gal β 1-4GlcNAc; and

m is at least ~~23~~ or 4,

with the proviso that

- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
- (4) the molar mass of the fragment X(K)_m is less than 20,000, and n is from 2 to 100,000,

and wherein X(B)_m are non-covalently bonded.

11. (previously presented) An aggregate according to claim 10 having a leaf-like, linear, cyclic, polycyclic, polyhedral, spherical or dendritic structure.

12. (currently amended) An aggregate according to claim 10 of two or more different compounds comprising a compound of the general formula (I)



wherein

X is an m-valent unit and

B are identical or different and denote K-R, wherein

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K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein
 A^1 is $(CH_2)_tY(CH_2)_u$, wherein
 Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,
 t is an integer from 0 to 6 and
 u is an integer from 0 to 6,
 (A^2-A^3) can be any A^2 and any A^3 in any combination,
 A^2 is $-NHCO-$ or $-CONH-$,
 A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein
 $r = 1$,
 sp is a divalent spacer or a bond, and
 k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, $Gal\alpha 1-3Gal$, $Gal\alpha 1-3(Fuca 1-2)Gal$, $GalNAc\alpha 1-3(Fuca 1-2)Gal$, $Neu5Ac\alpha 2-6GalNAc$, $SiaLe^A$, $SiaLe^X$, HSO_3Le^A , HSO_3Le^X , $Gal\alpha 1-3Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3Gal\beta 1-4Glc$, $Neu5Ac\alpha 2-6Gal\beta 1-4GlcNAc$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc$, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, $HSO_3GlcA\beta 1-3Gal$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc\beta 1-3Gal\beta 1-4Glc$, $GalNAc\alpha$, $GalNAc\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $HSO_3(Sia)Le^X$, $HSO_3(Sia)Le^A$, Le^Y , $GlcNAc\beta 1-6(GlcNAc\beta 1-3)Gal\beta 1-4Glc$, $GalNAc\beta 1-4(Neu5Ac\alpha 2-3)Gal\beta 1-4Glc$, mannose-6-phosphate, $GalNAc\beta 1-4GlcNAc$, oligo-sialic acid, N-glycolylneuraminic acid, $Gal\alpha 1-4Gal\beta 1-4Glc$, or $Gal\alpha 1-4Gal\beta 1-4GlcNAc$; and

m is ~~at least 23~~ or 4,

with the proviso that

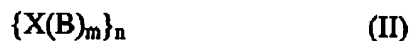
- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
- (4) the molar mass of the fragment $X(K)_m$ is less than 20,000.

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13. (canceled)

14. (previously presented) A method according to claim 27, further comprising adding a concentrated salt solution, changing the pH or the temperature, or adding organic solvents.

15. (currently amended) A method for changing the structure of an aggregate of the general formula (II)



wherein $X(B)_m$ may be identical or different and denote a compound of the general formula (I),



wherein

X is an m-valent unit and

B are identical or different and denote K-R, wherein

K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein

A^1 is $(CH_2)_tY(CH_2)_u$, wherein

Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A^2 and any A^3 in any combination,

A^2 is $-NHCO-$ or $-CONH-$,

A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, Gal α 1-3Gal, Gal α 1-3(Fuc α 1-2)Gal, GalNAc α 1-3(Fuc α 1-2)Gal, Neu5Ac α 2-6GalNAc, SiaLe^A, SiaLe^X, HSO₃Le^A, HSO₃Le^X, Gal α 1-3Gal β 1-4GlcNAc, Gal α 1-3Gal β 1-4Glc, Neu5Ac α 2-6Gal β 1-4GlcNAc, HSO₃GlcA β 1-3Gal β 1-4GlcNAc, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, HSO₃GlcA β 1-3Gal,

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HSO₃GlcAβ1-3Galβ1-4GlcNAcβ1-3Galβ1-4Glc, GalNAcα, GalNAcα1-3(Fuca1-2)Galβ1-4GlcNAc, Galα1-3(Fuca1-2)Galβ1-4GlcNAc, HSO₃(Sia)Le^X, HSO₃(Sia)Le^A, Le^Y, GlcNAcβ1-6(GlcNAcβ1-3)Galβ1-4Glc, GalNAcβ1-4(Neu5Acα2-3)Galβ1-4Glc, mannose-6-phosphate, GalNAcβ1-4GlcNAc, oligo-sialic acid, N-glycolylneuraminic acid, Galα1-4Galβ1-4Glc, or Galα1-4Galβ1-4GlcNAc; and

m is at least 23 or 4,

with the proviso that

- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
- (4) the molar mass of the fragment X(K)_m is less than 20,000, and

n is from 2 to 100,000,

and wherein X(B)_m are non-covalently bonded,

further comprising adding a concentrated salt solution, changing the temperature or the pH and/or adding urea, trifluoroethanol or peptides.

16. (previously presented) A method according to claim 27 further comprising increasing the specific physiological activities of molecules by incorporating a radical R into a compound of the general formula (I).

17. (canceled)

18. (currently amended) A method of treating diseases arising from inflammation, viral and bacterial infections, influenza viruses, selectin-mediated inflammatory processes, tumour metastases, or in the neutralisation of antibodies in autoimmune disorders and transplants; said method comprising administering a compound of the general formula (I)



wherein

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X is an m-valent unit and

B are identical or different and denote K-R, wherein

K is a bond or is $A^1-(A^2-A^3)_k\text{-sp}$, wherein

A^1 is $(\text{CH}_2)_t\text{Y}(\text{CH}_2)_u$, wherein

Y is $>\text{C}=\text{O}$, $>\text{NH}$, $-\text{O}-$, $-\text{S}-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A^2 and any A^3 in any combination,

A^2 is $-\text{NHCO}-$ or $-\text{CONH}-$,

A^3 is $(\text{CH}_2)_r$, $\text{O}(\text{CH}_2)_r$, or $\text{S}(\text{CH}_2)_r$, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, $\text{Gal}\alpha 1-3\text{Gal}$, $\text{Gal}\alpha 1-3(\text{Fuc}\alpha 1-2)\text{Gal}$, $\text{GalNAc}\alpha 1-3(\text{Fuc}\alpha 1-2)\text{Gal}$, $\text{Neu5Ac}\alpha 2-6\text{GalNAc}$, SiaLe^A , SiaLe^X , HSO_3Le^A , HSO_3Le^X , $\text{Gal}\alpha 1-3\text{Gal}\beta 1-4\text{GlcNAc}$, $\text{Gal}\alpha 1-3\text{Gal}\beta 1-4\text{Glc}$, $\text{Neu5Ac}\alpha 2-6\text{Gal}\beta 1-4\text{GlcNAc}$, $\text{HSO}_3\text{GlcA}\beta 1-3\text{Gal}\beta 1-4\text{GlcNAc}$, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, $\text{HSO}_3\text{GlcA}\beta 1-3\text{Gal}$, $\text{HSO}_3\text{GlcA}\beta 1-3\text{Gal}\beta 1-4\text{GlcNAc}\beta 1-3\text{Gal}\beta 1-4\text{Glc}$, $\text{GalNAc}\alpha$, $\text{GalNAc}\alpha 1-3(\text{Fuc}\alpha 1-2)\text{Gal}\beta 1-4\text{GlcNAc}$, $\text{Gal}\alpha 1-3(\text{Fuc}\alpha 1-2)\text{Gal}\beta 1-4\text{GlcNAc}$, $\text{HSO}_3(\text{Sia})\text{Le}^X$, $\text{HSO}_3(\text{Sia})\text{Le}^A$, Le^Y , $\text{GlcNAc}\beta 1-6(\text{GlcNAc}\beta 1-3)\text{Gal}\beta 1-4\text{Glc}$, $\text{GalNAc}\beta 1-4(\text{Neu5Ac}\alpha 2-3)\text{Gal}\beta 1-4\text{Glc}$, mannose-6-phosphate, $\text{GalNAc}\beta 1-4\text{GlcNAc}$, oligo-sialic acid, N-glycolylneuraminic acid, $\text{Gal}\alpha 1-4\text{Gal}\beta 1-4\text{Glc}$, or $\text{Gal}\alpha 1-4\text{Gal}\beta 1-4\text{GlcNAc}$; and

m is at least 23 or 4,

with the proviso that

- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and

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- (4) the molar mass of the fragment $X(K)_m$ is less than 20,000; or
 administering into an aggregate of the general formula (II)



wherein

$X(B)_m$ may be identical or different and denote a compound of the general formula (I), and

n is from 2 to 100,000,

and wherein $X(B)_m$ are non-covalently bonded.

19. (canceled)

20. (previously presented) A method according to claim 18 further comprising
 preparing functionalized molecular surfaces.

21-22. (canceled).

23. (currently amended) A compound of the general formula (I),



wherein

X is an m -valent unit and

B are identical or different and denote $K-R$, wherein

K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein

A^1 is $(CH_2)_tY(CH_2)_u$, wherein

Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A^2 and any A^3 in any combination,

A^2 is $-NHCO-$ or $-CONH-$,

A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein

$r = 1$,

sp is a divalent spacer or a bond, and

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k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, Gal α 1-3Gal, Gal α 1-3(Fuc α 1-2)Gal, GalNAc α 1-3(Fuc α 1-2)Gal, Neu5Ac α 2-6GalNAc, SiaLe^A, SiaLe^X, HSO₃Le^A, HSO₃Le^X, Gal α 1-3Gal β 1-4GlcNAc, Gal α 1-3Gal β 1-4Glc, Neu5Ac α 2-6Gal β 1-4GlcNAc, HSO₃GlcA β 1-3Gal β 1-4GlcNAc, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, HSO₃GlcA β 1-3Gal, HSO₃GlcA β 1-3Gal β 1-4GlcNAc β 1-3Gal β 1-4Glc, GalNAc α , GalNAc α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc, Gal α 1-3(Fuc α 1-2)Gal β 1-4GlcNAc, HSO₃(Sia)Le^X, HSO₃(Sia)Le^A, Le^Y, GlcNAc β 1-6(GlcNAc β 1-3)Gal β 1-4Glc, GalNAc β 1-4(Neu5Ac α 2-3)Gal β 1-4Glc, mannose-6-phosphate, GalNAc β 1-4GlcNAc, oligo-sialic acid, N-glycolylneuraminic acid, Gal α 1-4Gal β 1-4Glc, or Gal α 1-4Gal β 1-4GlcNAc; and

m is at least ~~23~~ or 4,

with the proviso that

- (1) X , B and m are so selected that an intermolecular association of the K in liquid phase is possible, especially under aqueous conditions, by the formation of hydrogen bonds, with formation of aggregates, and
- (2) the molar mass of the fragment $X(K)_m$ is less than 20,000, especially less than 4000.

24-26. (canceled)

27. (currently amended) A method of preparing an aggregate comprising:
 preparing a compound of the general formula (II)



wherein

$X(B)_m$ may be identical or different and denote a compound of the general formula (I),



wherein

X is an m -valent unit and

B are identical or different and denote $K-R$, wherein

K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein

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A^1 is $(CH_2)_t Y (CH_2)_u$, wherein
 Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,
 t is an integer from 0 to 6 and
 u is an integer from 0 to 6,
 (A^2-A^3) can be any A^2 and any A^3 in any combination,
 A^2 is $-NHCO-$ or $-CONH-$,
 A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein
 $r = 1$,
 sp is a divalent spacer or a bond, and
 k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, $Gal\alpha 1-3Gal$, $Gal\alpha 1-3(Fuca 1-2)Gal$, $GalNAc\alpha 1-3(Fuca 1-2)Gal$, $Neu5Ac\alpha 2-6GalNAc$, $SiaLe^A$, $SiaLe^X$, HSO_3Le^A , HSO_3Le^X , $Gal\alpha 1-3Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3Gal\beta 1-4Glc$, $Neu5Ac\alpha 2-6Gal\beta 1-4GlcNAc$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc$, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, $HSO_3GlcA\beta 1-3Gal$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc\beta 1-3Gal\beta 1-4Glc$, $GalNAc\alpha$, $GalNAc\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3(Fuca 1-2)Gal\beta 1-4GlcNAc$, $HSO_3(Sia)Le^X$, $HSO_3(Sia)Le^A$, Le^Y , $GlcNAc\beta 1-6(GlcNAc\beta 1-3)Gal\beta 1-4Glc$, $GalNAc\beta 1-4(Neu5Ac\alpha 2-3)Gal\beta 1-4Glc$, mannose-6-phosphate, $GalNAc\beta 1-4GlcNAc$, oligo-sialic acid, N-glycolylneuraminic acid, $Gal\alpha 1-4Gal\beta 1-4Glc$, or $Gal\alpha 1-4Gal\beta 1-4GlcNAc$; and

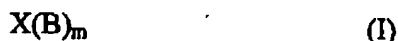
m is at least 23 or 4,

with the proviso that

- (1) in the compound at least one R is not hydrogen,
 - (2) there are at least two K that are not a bond, and
 - (3) X , B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
 - (4) the molar mass of the fragment $X(K)_m$ is less than 20,000, and
- n is from 2 to 100,000,
 and wherein $X(B)_m$ are non-covalently bonded.

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28. (currently amended) A method of preparing a therapeutic drug comprising:
 preparing the compound of the general formula (I)



wherein

X is an m-valent unit and

B are identical or different and denote K-R, wherein

K is a bond or is $A^1-(A^2-A^3)_k-sp$, wherein

A^1 is $(CH_2)_t Y(CH_2)_u$, wherein

Y is $>C=O$, $>NH$, $-O-$, $-S-$ or a bond,

t is an integer from 0 to 6 and

u is an integer from 0 to 6,

(A^2-A^3) can be any A^2 and any A^3 in any combination,

A^2 is $-NHCO-$ or $-CONH-$,

A^3 is $(CH_2)_r$, $O(CH_2)_r$, or $S(CH_2)_r$, wherein

r = 1,

sp is a divalent spacer or a bond, and

k is an integer from 5 to 100, and

R is hydrogen, sialic acid, sialyl lactose, sialyl lactosamine, lactose, mannose, $Gal\alpha 1-3Gal$, $Gal\alpha 1-3(Fuc\alpha 1-2)Gal$, $GalNAc\alpha 1-3(Fuc\alpha 1-2)Gal$, $Neu5Ac\alpha 2-6GalNAc$, $SiaLe^A$, $SiaLe^X$, HSO_3Le^A , HSO_3Le^X , $Gal\alpha 1-3Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3Gal\beta 1-4Glc$, $Neu5Ac\alpha 2-6Gal\beta 1-4GlcNAc$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc$, N-acetyl-lactosamine or polylactosamine, sialic acid benzyl glycoside, $HSO_3GlcA\beta 1-3Gal$, $HSO_3GlcA\beta 1-3Gal\beta 1-4GlcNAc\beta 1-3Gal\beta 1-4Glc$, $GalNAc\alpha$, $GalNAc\alpha 1-3(Fuc\alpha 1-2)Gal\beta 1-4GlcNAc$, $Gal\alpha 1-3(Fuc\alpha 1-2)Gal\beta 1-4GlcNAc$, $HSO_3(Sia)Le^X$, $HSO_3(Sia)Le^A$, Le^Y , $GlcNAc\beta 1-6(GlcNAc\beta 1-3)Gal\beta 1-4Glc$, $GalNAc\beta 1-4(Neu5Ac\alpha 2-3)Gal\beta 1-4Glc$, mannose-6-phosphate, $GalNAc\beta 1-4GlcNAc$, oligo-sialic acid, N-glycolylneuraminic acid, $Gal\alpha 1-4Gal\beta 1-4Glc$, or $Gal\alpha 1-4Gal\beta 1-4GlcNAc$; and

m is at least ~~23~~ or 4,

with the proviso that

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- (1) in the compound at least one R is not hydrogen,
- (2) there are at least two K that are not a bond, and
- (3) X, B and m are so selected that an intermolecular association of the K in liquid phase by the formation of hydrogen bonds is possible, with formation of aggregates that present on the surface a plurality of R that are not hydrogen, and
- (4) the molar mass of the fragment $X(K)_m$ is less than 20,000; or
preparing the compound of the general formula (II):



wherein

$X(B)_m$ may be identical or different and denote a compound of the general formula (I), and
n is from 2 to 100,000,
and wherein $X(B)_m$ are non-covalently bonded; and
a pharmaceutically acceptable carrier.

29. (canceled)